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TECHNICAL INFORMATION
REPORT 8-1-3A25(1)OFFICE, CHIEF OF ORDNANCE
AUGUST 1959DEVELOPMENT
OF
POINT-DETONATING FUZE, T312*PREPARED FOR THE U. S. ARMY
MATERIEL COMMAND BY THE ARMY
MATERIEL RESEARCH STAFF,
UNIVERSITY OF PITTSBURGH,
UNDER CONTRACT DA-36-034-AMC-
3785(X)*.

The T312 point-detonating (PD) fuze was a superquick impact fuze for testing developmental 81-mm mortar shell, pending the release for production of a fuze of the T186 series of point-detonating fuzes, which will function with either superquick or delayed action. The development of the T312 was authorized in September 1953, at the same time as was that of the T313 PD fuze for new 105-mm mortar shell. Except that the T312 contained a shorter bore-riding safety pin, the two fuzes were identical. Both were similar in design to the M77 time superquick (TSQ) fuze without its pyrotechnic delay train.

The T312 fuze combined an impact firing pin with a bore-safe superquick detonator contained in a slider held in the unarmed position by a bore-riding safety pin that was locked by a setback pin. Additional safety during storage and handling was provided by two cotter pins that had to be removed before the fuze could be used. The fuze consisted of the following main components:

1. A head, which contained the firing-pin assembly
2. An ogive spacer, between the head and the body
3. A body, which had a slider with an out-of-line detonator, a bore-riding safety pin that was ejected as the shell left the mortar tube, a setback pin, and a teteryl booster lead
4. An adapter, to connect the fuze body with the booster assembly

RELATED TIR'S

3-57	TIR 6-7-7A1(2)	81-mm HE Shell, T28 Series
7-58	TIR 6-7-8A1(1)	81-mm Chemical Shell, M370 (T30E9)
3-57	TIR 8-1-3	Development of Point-Detonating Fuzes for Artillery and Mortars
9-57	TIR 8-1-3A24(1)	PD Fuze, T186 Series
8-59	TIR 8-1-3A26(1)	PD Fuze, T313

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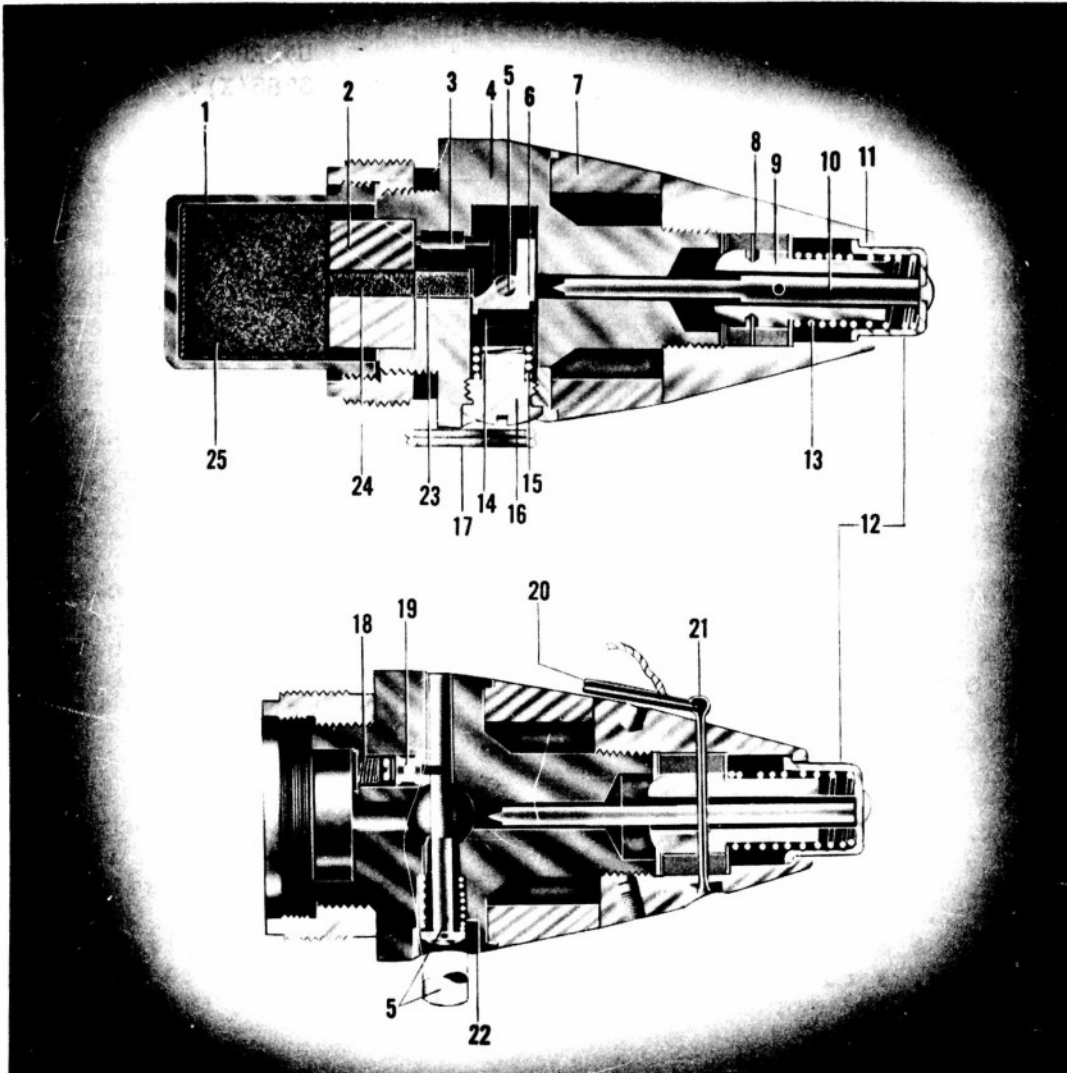
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PD FUZE, T312: SECTIONAL VIEW WITH BOOSTER (ABOVE) AND
SECTIONAL VIEW WITHOUT BOOSTER, TURNED 90° (BELOW)

- | | | |
|---------------------|-----------------------|---------------------------|
| 1. Booster Cup | 9. Plunger | 18. Setback Spring |
| 2. Booster Spacer | 10. Firing Pin | 19. Setback Pin |
| 3. Slider Guide Pin | 11. Head | 20. Upper Pull Ring |
| 4. Body | 12. Striker | 21. Head Cotter Pin |
| 5. Safety Pin | 13. Firing-Pin Spring | 22. Safety-Pin Spring |
| 6. Slider | 14. M29 Detonator | 23. Booster Lead Charge |
| 7. Ogive Spacer | 15. Slider Spring | 24. Booster Spacer Charge |
| 8. Shear Pin | 16. Slider Plug | 25. Booster Pellet |
| | 17. Lower Pull Ring | |

5. A booster cup containing a lead charge, a spacer charge, and the main booster charge

Safety devices of the fuze included the head cotter pin that kept the firing pin from moving, the long cotter pin that held the setback pin immobile, and a bore-riding safety pin that kept the detonator in an out-of-line position until the pin was ejected from the fuze. The T312 fuze was shipped and stored in this unarmed condition.

When a shell fitted with a T312 fuze was to be fired, the two cotter pins had to be removed before the shell was inserted into a mortar tube; a knotted cotton-twine cord connecting the pull rings of these pins was furnished to facilitate their removal. When the round was fired, the force of setback operating on the plunger of the firing-pin assembly broke the shear pins holding it in the sleeve, and the plunger then slid backwards against its seat; this was incidental to the subsequent operation of the firing pin. The force of setback also retracted the setback pin from the safety pin, which was then forced outward by its spring so that it rode against the bore while the shell traversed the tube. When the shell left the muzzle, the safety pin was ejected from the fuze, and the slider spring moved the slider so that the detonator was aligned with the firing pin and the booster lead charge. The fuze was therefore bore-safe and could not become armed until after the shell had left the mortar tube.

When the striker was forced rearward on impact, the firing pin was driven into the superquick detonator. The latter fired the booster lead charge, which set off the spacer charge and the main booster charge in turn; this detonated the explosive charge of the mortar shell.

The T312 fuze, which armed when fired with any permissible charge from an 81-mm mortar and at any elevation from zero to 90 degrees was as sensitive as the M52 PD and the M77 TSQ fuzes. The fuze passed the standard jolt and jumble tests for safety. Drop tests showed that, when the cotter pins were not removed, the T312 fuze in a T28 81-mm mortar shell could be dropped from heights up to 40 feet without detonating; when the pins were removed, the fuze could be safely dropped base down only a distance of 2 feet, which was comparable to the drop safety of the M52 and M77 fuzes with their pull wires removed.

In addition, the T312 was as sensitive as the fuzes of the T186 series under development for use in new 81-mm mortar ammunition. The release of the T186E11 for production in February 1957 and its subsequent classification as standard as the M524 PD fuze in May 1958 eliminated the need for the T312 fuze, and its development became inactive.

PRINCIPAL CHARACTERISTICS

Model	T312
Type	impact
Material	
Head	aluminum and brass
Ogive spacer	aluminum
Body	aluminum
Adapter	aluminum
Booster	aluminum
Weight	1.25 lb
Length	
Over-all	6.1 in
Intrusion	2.21 in
Thread size	2-12 UNS 1A
Arming	
Method	setback
Distance of arming delay	none beyond muzzle of weapon
Method of actuation	impact
Detonator	
Model	M29
Type	stab
Booster assembly	
Lead charge	4.76 grains of tetryl
Spacer charge	5.92 grains of RDX
Booster charge	612 grains of tetryl
Projectiles with which used	
81-mm HE shell	M362
81-mm chemical shell	M370

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